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09/763,857	05/31/2001	Ralf Trutschel	10191/1750	3474	
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ONE BROADWAY NEW YORK, NY 10004			KIM, CHRISTOPHER S		
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			3752	12	
			DATE MAILED: 08/12/2003	13	

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary Christopher S. Kim S752 Christopher S. Kim Christopher S. Kim			Applicati n	No	Applicant(s)	\mathcal{U}		
Examiner Christophers S. Klim 3752	•			140.				
Christopher S. Kim 3752 Period for Reply A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE Of this communication. 1975 SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION. If the period for reply specified above is beas then thiny (30) steps, a reply within the statisticy princived single and will apply and will apple 35 (5) MONTHS from the mailing date of this communication. If the period for reply specified shore is beas then thiny (30) steps, a reply within the statistic or reply specified above is beas then thiny (30) steps, a reply within the statistic or reply specified shore is beas then thiny (30) steps, a reply within the statistic or reply specified shore is beas then thiny (30) steps, a reply within the statistic or reply specified shore is beas then then the communication. If the period for reply specified shore is beas then thiny (30) steps, a reply within the statistic or reply specified shore is the statistic period will apply and ill apple 35 (5) MONTHS from the mailing date of this communication, are reply be timely filed, may reduce a ny seamed patient medigination. A prophy reduced by the Office later than there mediting date of this communication, were it timely filed, may reduce any seamed patient medigination. Status Status Status Status Status Status Claim (s) 12-22 is/are pending in the application for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11, 453 O.G. 213. Disposition of Claims 4) Claim(s) 12-22 is/are rejected. Claim(s) 12-22 is/are rejected to. Solical (s) 12-22 is/are rejected to. Claim(s) 12-22 is/are rejected to. Claim(s) 12-22 is/are rejected to. Claim(s) 13-24 is/are objected to by the Examiner. Application Papers 9 The specification is objected to by the Examiner. Application Papers 9 The specification is objected to by the Examiner. If the proposed drawing correction filed on is: a) approved by di	Office Action Summary							
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DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submissions filed on March 26, 2003 and June 25, 2003 have been entered.

Response to Amendment

- 2. This Office action utilizes line numbers, which includes numbering of blank lines, provided by the applicant when referring to lines in the <u>specification</u> section of the application by line number.
- 3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Drawings

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "direct injection of a fuel into a combustion chamber of the internal combustion engine" recited in claim 12;

the "entry plane" recited in claim 12; the "projection" recited in claim 12 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

5. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: "entry plane" and "projection" recited in claim 12.

Claim Rejections - 35 USC § 112

6. Claim 19 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 19 recites the limitation "the valve seat element includes a spray element... the spray element is fixedly connected to the valve seat element." Applicant has defined the "spray element" as a subcomponent of the "valve seat element." It is not apparent how an element can be fixedly connected to itself.

Claim R j ctions - 35 USC § 103

7. Claims 12-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imafuku et al. (4,890,794) in view of Shen et al. (5,878,962).

With respect to claims 12, 13 and 15-22, Imafuku et al. discloses a fuel injector comprising: an energizable actuating element 14; a valve needle 27; a fixed valve seat 48; a valve seat element 9, 55; an orifice 54a,b; a valve closing section 47; a flattened face (downstream end of 45); an outlet orifice (outlet of orifice 54a,b). The entry plane of the outlet orifice (outlet of orifice 54a,b) is arranged such that the entry plane is completely covered by a projection of the flattened face (downstream end of 45) into the entry plane (projection of downstream end of 45 onto orifice 45 at an angle such that the projection completely covers the orifice). Imafuku et al. does not disclose a swirl-producing element. Shen et al. discloses a swirl-producing element 38, 48 upstream of a fixed valve seat 34. It would have been obvious to a person having ordinary skill in the art at the time of the invention to have incorporated the swirl-producing element of Shen et al. to the device of Imafuku et al. to provide a swirl pattern spray.

With respect to claim 14, Imafuku et al. in view of Shen et al. discloses the limitations of the claimed invention with the exception of the ratio. It would have been obvious to one having ordinary skill in the art at the time the invention was made to d/D of approximately 1.5 for optimization dependent of operating criteria, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

8. Claims 12-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ren et al. (5,996,912).

Ren et al. differs from what is being claimed in the flattened face diameter d being greater than the outlet orifice diameter. Ren et al. discloses an outlet orifice diameter d_0 which is greater than the flattened face diameter d_f . This embodiment is precisely the embodiment applicant discloses in figure 6 and on page 9, lines 8-13 of the current application. Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to have optimized the values of d_0 and d_f for desirability dependent on certain applications (applicant's specification, page 9, line 12).

Response to Arguments

9. Applicant's arguments filed June 25, 2003 have been fully considered but they are not persuasive. Amendments filed June 25, 2003 and March 26, 2003 contain identical arguments.

In response to applicant's argument directed to the drawing objections, applicant first states that the "direct injection of a fuel into a combustion chamber of the internal combustion engine" is adequately shown in figure 1. Applicant then states that such a feature is a "conventional feature" and need not be illustrated in the figures. If adequately shown, applicant is required to identify the "direct injection of a fuel into a combustion chamber of the internal combustion engine" in the figures in applicant's next response. If it is not shown, applicant's argument of "conventional feature" is moot.

Convention features may not be required in the drawings for adequate disclosure, but 37 CFR 1.83(a) clearly requires the drawings to show every feature of the invention specified in the claims.

In response to applicant's argument that the flattened face projection of Imafuku et al. does not cover the outlet orifice, The entry plane of the outlet orifice (outlet of orifice 54a,b) is arranged such that the entry plane is completely covered by a projection of the flattened face (downstream end of 45) into the entry plane (projection of downstream end of 45 onto orifice 45 at an angle such that the projection completely covers the orifice).

In response to applicant's argument that Shen et al. does not teach a flattened face projection which covers the outlet orifice, Shen et al. is not relied on for such a teaching.

In the rejection under 35 U.S.C. 103(a) as being unpatentable over Ren et al., applicant alleges that the rejection is improperly based on hindsight because it relies on applicant's disclosed motivation. Applicant have given no motivation for the embodiment disclosed in figure 6 except for that it "may be desirable for certain applications." Applicant discloses a first species, in figures 3-5, in which d>D and a second species in figure 6 in which d<D. Ren et al. identifies and defines dimension d (d_f) and D (d_o). It is well within one having ordinary skill in the art to optimize these values dependent on application criteria. *In re Aller*, 105 USPQ 233. Applicant's disclosure of "may be desirable for certain applications" is not being relied on for motivation but rather identified for further evidence.

In response to applicant's argument Ren et al. does not teach a flattened face projection which covers the outlet orifice, such a condition is inherent when d_f>d_o.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher S. Kim whose telephone number is (703) 308-8336. The examiner can normally be reached on Monday - Thursday, 6:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Y. Mar can be reached on (703) 308-2087. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9302 for regular communications and (703) 872-9303 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1113.

Chástopher S. Kim Primary Examiner Art Unit 3752

CK August 9, 2003